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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/697,120

10/31/2003

Michael Schmidt

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EXAMINER

LE, THI Q

ART UNIT

PAPER NUMBER

2613

MAIL DATE

DELIVERY MODE

07/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/697,120

Applicant(s)

SCHMIDT ET AL.

Examiner

Thi Q. Le

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This Action is in response to Applicant's amendment filed on 11/14/2006. **Claims 1-9** are still pending in the present application. **This Action is made FINAL**

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 1, 2 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Widdowson et al. ("Polarisation guiding in ultralong distance soliton transmission". Electronics Letters, IEE Stevenage, Volume 30, Issue 11, 26 May 1994 pages 879-880, ISSN: 0013-5194).**

Consider **claim 1**, Widdowson et al. clearly show and disclose, a receiver for an optical time division multiplexed pulse train in which the pulses have alternating polarizations (read as, PDM/OTDM transmitted signal), the receiver comprising: a) a polarization insensitive optical switch (read as, optical time division demultiplexer) for isolating optical pulses within the pulse train, and b) a polarization selective element (read as, polarizer) for separating from the pulses at least one component that has a single polarization (figure 3; page 880, left column, second paragraph). Widdowson et al. fails to disclose wherein the separation of the pulses is done after the pulses have been isolated.

The configuration of the polarization insensitive optical switch (read as, optical time division demultiplexer) and the polarization selective element (read as, polarizer) as shown by Widdowson et al. produces the same result as would the configuration recited in the claim. The reason being, the time division demultiplexer simply perform the task of separating pulses in the time domain, while the polarizer simply perform the function of isolating a particular polarization state. By providing the polarizer in the front or in the back of the time division demultiplexer will produce the same result, since their function are not dependent upon each other. Thus, it would have been obvious for a person of ordinary skill in the art at the time of the

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invention to modify the teachings of Widdowson et al., such that (read as, optical time division demultiplexer) is placed before the polarization selective element (read as, polarizer). Since, it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Consider **claim 2, and as applied to claim 1 above**, Widdowson et al. further disclose, a polarization controller for altering the polarization of the isolated pulses, (polarization controllers within the loop allowed accurate control of the signal State of Polarization) (figure 3; page 880, left column, second paragraph). Widdowson et al. fails to disclose the polarization controller being disposed between the optical switch and the polarization selective element.

Although the polarization controller is not disclosed as being between the polarization insensitive optical switch (read as, optical time division demultiplexer) and the polarization selective element (read as, polarizer). It would have been obvious for a person of ordinary skill in the art at the time of the invention to modify the teaching of Widdowson et al., such that the polarization controller is placed between the polarization insensitive optical switch (read as, optical time division demultiplexer) and the polarization selective element (read as, polarizer). Since both configurations produce the same result, as explained in claim 1 above; further, it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Consider **claim 6**, Widdowson et al. clearly show and disclose, a method for receiving an optical time division multiplexed pulse train in which the pulses have alternating polarizations, the method comprising the steps of: a) isolating optical pulses from the pulse train by a polarization insensitive optical switch (read as, demultiplexing the optical PDM/OTDM signal

using an optical time division demultiplexer), and b) separating from the pulses at least one component that has a single polarization (read as, using a polarizer for separating different polarization states) (figure 3; page 880, left column, second paragraph). Widdowson et al. fails to disclose wherein the separation of the pulses is done after the pulses have been isolated.

The configuration of the polarization insensitive optical switch (read as, optical time division demultiplexer) and the polarization selective element (read as, polarizer) as shown by Widdowson et al. produces the same result as would the configuration recited in the claim, for the reason as explained in claim 1 above. It would have been obvious for a person of ordinary skill in the art at the time of the invention to modify the teachings of Widdowson et al., such that (read as, optical time division demultiplexer) is placed before the polarization selective element (read as, polarizer). Since, it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Consider **claim 7, and as applied to claim 6 above**, Widdowson et al. clearly show and disclose wherein the polarizations of the pulses are altered by a polarization controller before the pulses are separated into components having a single polarization. Widdowson et al. fails to disclose polarization alteration of isolated pulses.

Since the receiver as disclosed by Widdowson et al. have a polarization controller, a polarization insensitive optical switch (read as, optical time division demultiplexer) and a polarization selective element (read as, polarizer); rearranging the order of the elements within the receiver would have produced the same result as long as the three elements are present, for the reason as explained in claim 1 above. Thus, It would have been obvious for a person of ordinary skill in the art at the time of the invention to modify the teaching of Widdowson et al.,

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such that the input signal passes through the polarization insensitive optical switch (read as, optical time division demultiplexer) first then through the polarization controller and finally through the polarization selective element (read as, polarizer). Further, it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

5. **Claims 3-5 and 8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Widdowson et al. ("Polarisation guiding in ultralong distance soliton transmission". Electronics Letters, IEE Stevenage, Volume 30, Issue 11, 26 May 1994 pages 879-880, ISSN: 0013-5194) in view of Heismann et al. ("Automatic polarization demultiplexer for polarization-multiplexed transmission systems". Proceedings of the European Conference on Optical Communication (ECOC) MONTREUX, SEPT. 12 - 16, 1993. REGULAR PAPERS, ZURICH, SEV, CH, vol. 2 CONF. 19, 12 September 1993 (1993-09-12), pages 401-404).**

Consider **claim 3, and as applied to claim 2 above**, Widdowson et al. disclose the invention as described above; except for, wherein the polarization selective element is a polarization beam splitter having a first output port and a second output port, wherein the first output port emits a first component of the isolated pulses having a first polarization, and the second output port emits a second component of the isolated pulses having a second polarization that is distinct from the first polarization.

In related art, Heismann et al. disclose a polarization demultiplexer for polarization-multiplexed fiberoptic transmission systems. Wherein, the receiver includes an erbium-doped fiber amplifier, an automatic polarization transformer and a fiberoptic polarization splitter (read

as, beam splitter). The two outputs of the ports of the splitter feed into conventional 10-Gb/s receivers with photo diodes (figure 1; page 402 second paragraph).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teaching of Heismann et al. with Widdowson et al. In the effort to double transmission capacity, data are modulated into light wave with different polarization. Thus it is necessary at the receiver to have a polarization splitter to separate data for further processing.

Consider **claim 4 and as applied to claim 3 above**, Widdowson et al. as modified by Heismann et al. further disclose, wherein the first output port is connected to a pulse detector (read as, photo diode for channel 2; figure 1, Heismann et al.) for extracting digital information, and the second output port is connected to a power detector (read as, the time averaged mixing product measures as optical power of the selected channel; figure 1, Heismann et al.) that forms, together with the polarization controller and the polarization beam splitter, a control feedback loop (read as, the measurement of optical power of selected can serve as the feedback signal for the automatic polarization transformer to adjust the input State of Polarization for maximum power of the selected signal; figure 1, Heismann et al.) for controlling the polarization controller (Heismann et al.; figure 1; page 403 left column first paragraph).

Consider **claim 5, and as applied to claim 4 above**, Widdowson et al. as modified by Heismann et al. further disclose, a clock recovery module (read as, automatic clock recovery circuit; Heismann et al.; figure 1) that is connected to the pulse detector for extracting a clock signal to be fed to the optical switch (Heismann et al.; figure 1; page 403 left column first paragraph).

Consider **claim 8, and as applied to claim 6 above**, Widdowson et al. disclose the invention as described above; except for, wherein a first and a second component having different polarizations are separated from the pulses, wherein the first component is used for extracting digital information and the second component is used for controlling the polarization controller in a control feedback loop (note, Widdowson et al. disclosed the device necessary to produce an isolated pulse as described above).

In related art, Heismann et al. disclose a first and a second component having different polarizations are separated from the pulses (read as, the polarization splitter separate the two polarization components of the optical signal; figure 1 page 402 second paragraph), wherein the first component is used for extracting digital information (read as, channel 2; figure 1) and the second component is used for controlling the polarization controller in a control feedback loop (read as, output from the photo diode which represent channel 1 are use in a feedback loop for controlling the polarization transformer; figure 1) (figure 1; page 402 left column second paragraph ; page 403 left column first paragraph)

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teaching of Heismann et al. with Widdowson et al. Since Heismann et al. show that without active SOP corrective means the error rate of the system increase over time until the receiver fails to receive the transmitted signal. But with SOP correction active, error rate for transmission can be maintain. Thus, it is necessary to have a feedback loop for monitoring the output signal.

Consider **claim 9, and as applied to claim 8 above**, Widdowson et al. as modified by Heismann et al. further disclose, wherein the polarization controller is controlled by the control

feedback (read as, the measurement of the optical power of the selected signal) loop such that the optical power of the second component is minimal (read as, the polarization transformer adjust the SOP so that output optical power is maximum) (Heismann et al.; figure 1; page 403, paragraphs 1 and 2).

Note, Heismann et al. disclose a feedback back loop for controlling the polarization transformer in-order to achieve maximum optical power of selected signal; it could be understood by a person of ordinary skill in the art that to maximize the power of a selected channel, power from other channel are minimized in the process.

Response to Arguments

6. Applicant's arguments filed 4/20/2007 have been fully considered but they are not persuasive.

On page 3, second paragraph, applicants argue, isolating the optical pulses before separating the pulses of different polarization allows a relaxation of the constraints imposed on the OTDM demultiplexer; because components in the isolated pulses that result from interchannel interference can be largely eliminated by the subsequent polarization selective element. The Examiner submits that without undue experimentation one of ordinary skill in the art would have reverse the order of operation to pulse isolation then polarization separation; at least for the reasons below: first, applicants state that constraints are relaxed for the OTDM demultiplexer; but the type of constraints are not clearly explained or defined. Further, the specification did not clearly disclose the level of improvement that is achieved. Even though the result may not be exactly the same when the operation is reverse, there is no support in the

specification about a significant improvement, which would require undue experimentation. Hence one of ordinary skill in the art, would have known to firstly isolate optical pulses, and then separates the polarization of the pulses.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Thi Le whose telephone number is (571) 270-1104. The Examiner can normally be reached on Monday-Friday from 7:30am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Rafael Perez-Gutierrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Thi Le


KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER